

Commissioning in the ENERGY STAR Homes Program



ENERGY STAR Homes

- ◆ New England Utility Companies
- ◆ U.S. EPA and DOE
 - *joined together to* -
- ◆ Promote the benefits of energy efficient, high performance homes.



Program Standards

◆ National standard set by DOE and EPA

◆ Rated as 'Five Star' Home

◆ 30% Energy Savings over 1993 MEC

◆ Third party certification

Most efficient	
90-100	☆☆☆☆☆+
86-89	☆☆☆☆☆
83-85	☆☆☆☆+
80-82	☆☆☆☆
70-79	☆☆☆+
60-69	☆☆☆
50-59	☆☆+
40-49	☆☆
20-39	☆+
0-19	☆
Least efficient	

◆ Local standards modified to incorporate...

- Prescriptive Technical Standards
- Mech. Ventilation Requirement
- Adjustments for Insulation Performance
- COMMISSIONING

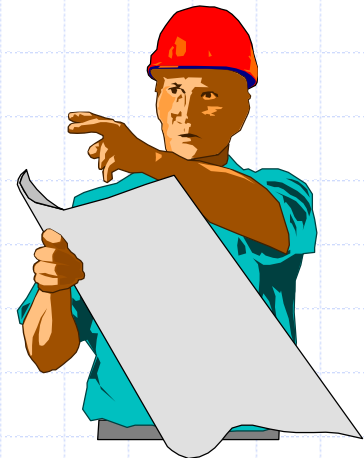
Utility Company Goals

- ◆ Support homebuyers, builders
- ◆ Provide *free* certification and incentives
- ◆ Promote the benefits of high performance homes
- ◆ REDUCE EMISSIONS
- ◆ DEMAND SIDE MANAGEMENT



New Energy Code

- ◆ New Massachusetts Energy Code (3/98, custom MEC 95)
 - Recent Impact Analysis
- ◆ ENERGY STAR is a small step up from code
 - Bigger step up from actual building practices
- ◆ HERS is compliance option



HVAC Commissioning in ENERGY STAR Homes

DUCT DISTRIBUTION

- ◆ Heat/Cool Load Calculations for *each* room
- ◆ Airflow Measurement and Analysis
- ◆ Duct Leakage Testing
- ◆ Evaluation of Refrigerant Charge (AC only)

HOT WATER DISTRIBUTION

- ◆ Limited in Scope (design support)
- ◆ Low Income Projects, Builder Outreach
- ◆ Heat Load Calculations
- ◆ Boiler and Baseboard Sizing

Microsoft Excel - Takeoffs [Read-Only]

File Edit View Insert Format Tools Data Window Help

A1 = ROOM

	A	B	C	D	E	F	G	H	I	J
1	ROOM	1	2	2	2	3	4	5	5	6
2	passwd=pass	Entry	Study (1)	Study (2)	Study (3)	Living Room	Dining Room	Kitchen (1)	Kitchen (2)	Family Room (1)
3	Width (gable end)	16.0	24.0	18.0	3.0	14.0	14.0	15.0	25.5	16.0
4	Length	11.0	12.0	8.5	11.0	13.0	13.5	6.0	17.5	18.0
5	Height 1	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
6	Height 2	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
7	Base Area	176.0	288.0	153.0	33.0	182.0	189.0	90.0	446.3	288.0
8	Area Correction							135.0		85.5
9	Area	176.0	288.0	153.0	33.0	182.0	189.0	225.0	446.3	373.5
10										
11	Volume									
12	Std Volume	1760.0	2880.0	1530.0	330.0	1820.0	1890.0	2250.0	4462.5	3735.0
13	Auto Vol correction	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14	Man. Vol correction									
15	Total Volume	1760.0	2880.0	1530.0	330.0	1820.0	1890.0	2250.0	4462.5	3735.0
16										
17	CEILING									
18	Flat Ceiling	176.0	288.0	153.0	33.0	182.0	189.0	225.0	446.3	373.5
19	Man Flat Ceiling									
20	Total Flat Ceiling	176.0	288.0	153.0	33.0	182.0	189.0	225.0	446.3	373.5
21	Sloped Ceiling	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
22	Man Sloped Ceiling									
23	Total Sloped Ceiling	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
24										
25	1) FLAT R30				33.0			225.0		
26	2) Cathedral									

Summary RJ Summary Takeoffs Tray Calc Door Calcs Window Calcs Slab Ducts BD Inputs BC

Draw AutoShapes

Ready

Start | Inbox - M... | Microsoft... | Exploring... | Takeof... | 11:57 AM



RIGHT-J SHORT FORM Entire House

Conservation Services Group

Job: 9771 7/16/01

40 Washington Street, Westborough, MA 01581 Phone: 508-836-9500 Fax: 508-836-3181

Project Information

For: Joe Homeowner
Worcester, MA

ROOM NAME	Area (ft ²)	Htg load (Btuh)	Clg load (Btuh)	Htg AVF (cfm)	Clg AVF (cfm)
Exercise Rm	400	3908	1077	106	52
Mech Room	149	2423	390	66	19
Library	313	4207	1779	114	85
Stair/Closet	76	1181	505	32	24
Great Rm	538	8856	5895	241	282
Foyer	449	9313	6273	253	300
Wash Rm	45	542	180	15	9
Dining Rm	361	8263	5883	225	281
Entire House	2331	38694	21983	1052	1052
Ventilation air		2759	376		
Equip. @ 0.89 RSM			19900		
Latent cooling			5178		
TOTALS	2331	41453	25078	1052	1052

Printout certified by ACCA to meet all requirements of Manual J 7th Ed.

Airflow Measurements

(<http://www.alnor.com/cci/loflo.htm>)



Duct Leakage Testing

DUCT BLASTER TEST

- ◆ Traditional Testing Protocol
- ◆ Equalize Pressure Difference Between House and Duct System Using Duct blaster
- ◆ Basement Door Open or Closed?
- ◆ Unequal Pressures Throughout System -> Placement of Pressure Probe?

3/30 FLOWHOOD TEST

- ◆ 3 = Max. Pressure Difference Between House and Duct System(s)
- ◆ 30 = Min. Flow Through Flowhood
- ◆ Advantages
 - Quick and Simple
 - Improved Accuracy

Air Conditioning Performance Testing

- ◆ EPA Certified Technicians
- ◆ Charge and System Airflow Evaluated
- ◆ Step by Step Software Program
- ◆ Superheat, Subcooling or Weigh-in



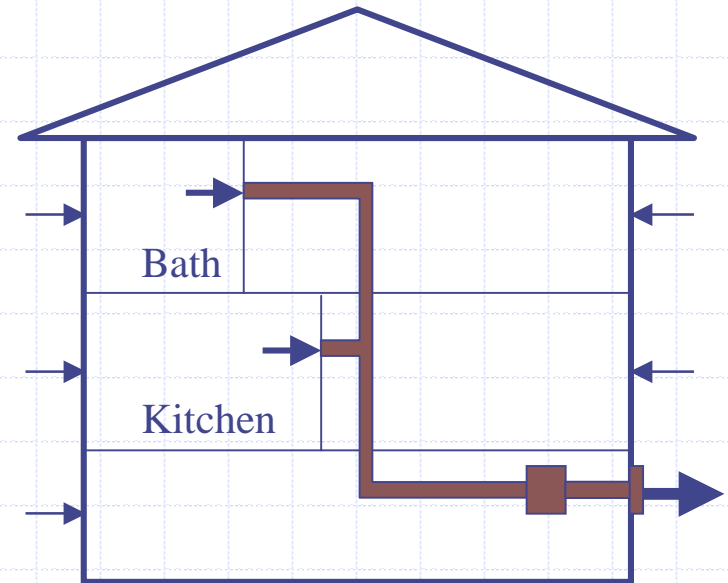
Blower Door Testing

The specifications of every ENERGY STAR Home include a “Maximum Allowable Infiltration Rate”

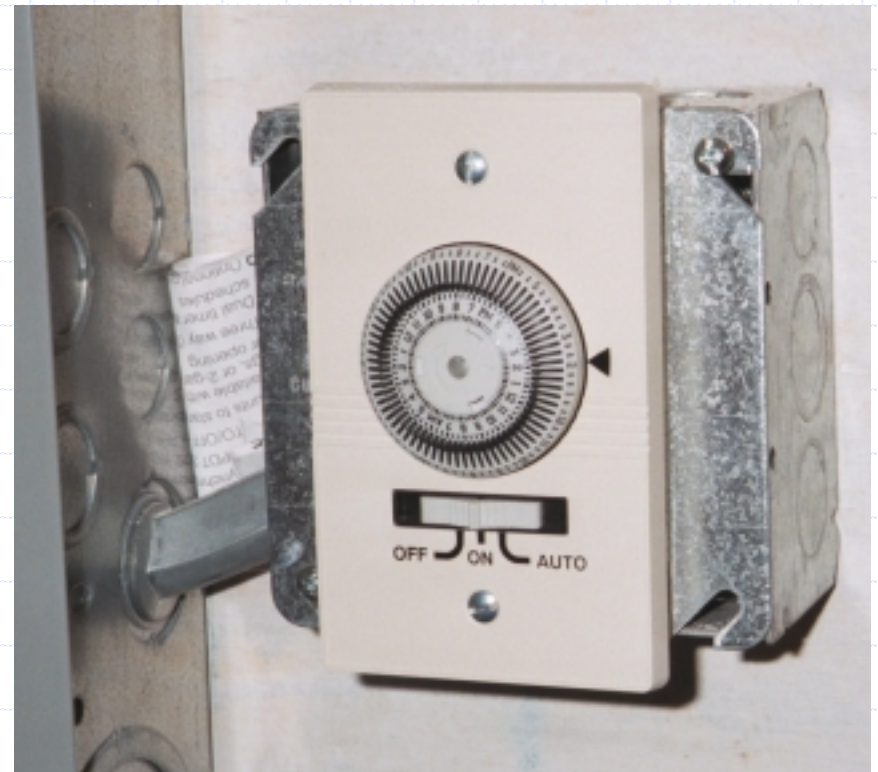


Controlled Mechanical Ventilation

- ◆ Prescriptive Requirement
- ◆ Based on ASHRAE Standards
- ◆ Controls set according to system airflow and blower door results



Simple Mechanical Ventilation System



Thank You!

Contact Information

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